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CONNECTION METHOD OF OPTICAL FIBERS

Author (Kenji Inoue et al.)

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<u>Inventor</u>	:	Kenji Inoue, Yoshiuki Imada, Takeshi Satake, Jyunichi Ueda
<u>Applicant</u>	:	Dainippon Densen Co
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## Specification

### 1. [Title of the invention]

#### CONNECTION METHOD OF OPTICAL FIBERS

### 2. [Scope of the patent claims]

(1). Connection method of optical fibers is characterized such that by mutually butting the tips of optical fibers to be connected, both connection tips of optical fibers are formed, and, while the heating device is equipped with loop shaped nozzles in which the tips that surround the butting surface of the tips of the fiber connection is open, both connection tips of the aforementioned optical fibers are welded by welding heat of the flame spray from the multiple flame spray ports that are set up on the side that face the center direction of the aforementioned loop nozzles.

(2). The connection method of optical fibers described in the item 1 of the patent claim wherein aforementioned multiple flame spray ports are the three flame spray ports that are set up on the side that faces the center direction of aforementioned looped nozzles, and do not face each other, separated with the 120 deg angles respectively.

### 3. [Detailed explanation of the invention]

#### [Utilized field in industry]

The present invention relates to the connection method of optical fibers, and after matching the shafts of the optical fibers to be connected, the tips of matching shafts of the optical fibers

is fusion welded.

Regarding the traditional connection method of this type, there is arc welding method wherein it consists of shaft matching mechanism of the fibers and the electrical discharge device, and the connection parts are welded by arc. According to this method, discharge current of arc, and discharge position and the like are adjusted, thus optimum conditions are set up and the connection is done. However, according to this method, the device as a whole which requires high voltage source becomes large, on site, particularly, in stringing connection and the like, it can not be done too easily, hence, and sufficient workability is not obtained.

And there is an electrical heat welding method wherein electrical heating line is placed in the fiber connection part, and using this heat, welding connection is done. According to this method, thermal effect is poor, it can be used for multiple ingredient optical fibers with the low melting point, however, regarding the optical fibers consisting of graphite glass with its melting point about 1,600 deg C, the defect is that it is not possible to do the connection superior in connection strength, and connection precision.

The purpose of the present invention is to solve above described defects, and provide the connection method which is superior in workability, connection strength, and connection precision, and

also, does not reduce the optical fibers performance, and This method of optical fibers is characterized such that by mutually butting the tips of optical fibers to be connected, both connection tips of optical fibers are formed, and, while the heating device is equipped with loop shaped nozzles in which the tips that surround the butting surface of the tips of the fiber connection is open, both connection tips of the aforementioned optical fibers are welded by welding heat of the flame spray from the multiple flame spray ports that are set up on the side that face the center direction of the aforementioned loop nozzles.

Next, an embodied example of the connection method of the present invention is explained according to the drawing of the embodied example.

Figure 1 shows one embodied example of the present invention. 7 is a looped nozzles, 71 is its neck part. Looped nozzles 7 is connected to the small type flame torch 6 wherein the heater at neck part 71 uses acetylene and the like as the material.

1, 1 is optical fibers of graphite glass covered by nylons and the like to be connected, and forms the both connection tips of the optical fibers by fixing the optical fibers by the optical fibers fixing device (not shown) in the state where cover-removed tips 2, 2 are butted mutually. Next, in order that the butting surface of the aforementioned connection tips is positioned in the center of looped nozzles 7 from the location where the tips

of looped nozzles 7 are open, looped nozzles 7 is positioned. On the side that faces the center direction of looped nozzles 7, three flame spray ports 72, 72, 72 are set up which do not face each other, spatially separated with the angle of 120 deg respectively, and from flame spray port 72, the welding heat by the high temperature flame spray of 1,600 deg C ~ 2,200 deg C is applied on the butting surface of both connection tips 2, 2 of the optical fibers 1, 1, thus fusion welding. In case the optical fibers are connected by welding by flame spray, if the welding heat by flame spray is applied only from one direction, the control of gas pressure is difficult, and when a long flame is applied, there is a risk of shaft deviation. Hence, according to the embodied example of the present invention, on the side that faces the center direction of looped nozzles 7, the flames are applied uniformly from the three flame spray ports 72, 72, 72 set up separated by the angle of 120 deg respectively, thus, the gas pressure from each flame spray port are cancelled out, thus preventing shaft deviation by gas pressure.

Furthermore, the butting tips of optical fibers are flamed from the surrounding, hence, the fusion is complete and highly reliable and low loss connection is made. And, each flame spray port does not face each other; hence, there is very little interference among flames themselves.

According to the above described method of the present

invention, optical fibers are fusion welded using the welding heat by the flame spray of a small heater, the flame torch in the present invention, hence, even in connecting the optical fibers with high melting point such as quartz glass, the work is done in a short time, and the device is simple, and light, can be used for stringing connection and the like, is superior in workability and connection strength, furthermore,

Multiple flame spray port is set up on the side that faces the center direction of the looped nozzles in which the tip that surrounds the butting surface of the optical fibers connection tip is open, and from this multiple flame spray port, flame can be applied uniformly on the optical fibers connection tip, thereby, The gas pressure from each flame spray port is cancelled out, thus preventing shaft deviation by gas pressure. And also, since the butting tips of optical fibers are flamed from the surrounding, the complete connection is enabled, and high reliability and low loss connection are enabled also.

By three flame spray ports 72, 72, 72 that are set up which do not face each other, separated with the angle of 120 deg respectively, gas flame fluctuation by the interference among flames are controlled, thus, the optical fibers connection tips are uniformly heated, thus connection is done with low loss.

#### 1. [Simple explanation of the drawings]

Figure 1 shows one embodied example of the present invention.

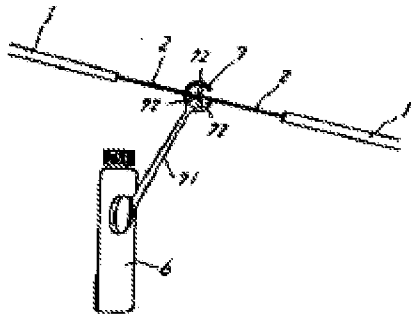


图 1